## REMARKS/ARGUMENTS

In the Specification, paragraph [0016] has been amended to indicate that U.S. Patent Application No. 09/435,552 as referred to therein has issued as U.S. Patent No. 6,335,765.

In the Office Action all of the pending claims 1-8 have been rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,377,269 to Kay, et al. It is respectfully requested that this rejection of the claims be reconsidered and withdrawn in view of the foregoing amendment of the claims and the arguments that follow.

It is first respectfully noted that a claim is anticipated under 35 U.S.C. §102 only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail in the reference as is contained in the claim. (MPEP 2131.)

Claim 1 of the present application is drawn to a method for rendering an image layer scene. Claim 1 features the steps of (a) defining a scene of image layer elements, (b) rendering the elements of the image layer scene over a black background to obtain components for each pixel of the image layer scene rendered over black, (c) rendering the elements of the image layer scene over a white background to obtain components for each pixel of the image layer scene rendered over white, and (d) combining the components for each pixel of the image layer scene rendered over black with the components for each corresponding pixel of the image layer scene rendered over white to form the rendered image layer scene. By the foregoing amendment, Claim 1 has been amended to clarify that the steps of rendering the elements of the image layer scene over a black background and over a white background are performed in a computer. Thus, the rendering of the image layer scenes over a black background and over a white background are performed using computer graphics generation techniques. Claim 1 has also been amended to clarify that the elements of the image layer scene are rendered over a full black background and over a full white background. That is, the image layer scenes are rendered over full black and full white as defined by the color components for each pixel defining the black and white backgrounds. Finally, Claim 1 has been amended to

clarify that the components obtained from rendering the elements of the image layer scene over a full black background and over a full white background are color components (versus transparency components). It is respectfully submitted that these amendments are fully supported by the application specification as originally filed. As discussed in the application specification, by employing the method for rendering an image layer scene featured in Claim 1, as amended, a rendered image layer scene may be obtained wherein the image layer scene may be composited with one or more other image layers in a manner such that the elements of the image layer scene are accurately rendered such that the resulting composition of image layers will appear as if all of the layers forming the image were rendered as simultaneously as a single scene.

Kay, et al. describes a system and method for extracting a foreground subject from a photographic image, isolating the subject so that the subject may later be composited in a different scene in another image. The patent recognizes the difficulty of performing such an extraction from a photographic image, particularly, the inability to mask out the desired subject from a photograph so as to produce semi-transparent areas of the subject of the proper colors.

To obtain the desired result, Kay, et al. describes taking two separate photographs of the subject to be extracted. Each photograph is taken with the subject in front of a different background color. For example, one photograph of the subject is taken in front of a "black" background with the other photograph of the subject taken in front of a "white" background. The two photographs may be taken with a digital camera, with the resulting digital images provided directly to a computer for processing, or may be taken with a conventional film camera, with the resulting photographs scanned into a computer system for processing. (Appropriate registration of the subject in the two images must be obtained prior to processing. If there is mis-registration between the two supplied images edge detail may be lost.)

Kay, et al. teaches that for each pixel in the subject image a transparency value is calculated using a cubic color model by finding the Cartesian "distance" between the color components in each pixel divided by the maximum "distance" between the color

components of the two backgrounds in a part of the two photographic images where the foreground subject is totally transparent. The calculated transparency value is then used to calculate each color component for each pixel of the subject image as the difference between the color component value for the pixel from one of the photographic images and the same color component value for the background color used in that photographic image times one (1) minus the transparency value, the product of which is added to the color component value for the background color. This calculation may be performed for each pixel using either one of the photographic images, but preferably may be performed using both photographic images with the resulting color values averaged to obtain the final color values for the foreground subject. This process is illustrated in Fig. 14 of Kay, et al., and the details of the particular calculations performed are presented in column 7 thereof.

It is first respectfully noted that Kay, et al. deals exclusively with the generation of a mask for extracting a foreground subject from a photographic image. The method described in Kay, et al. begins with obtaining two separate photographs of the relevant subject. In contrast, Claim 1, as amended, specifically is drawn to a method for rendering an image layer scene in a computer from computer generated image layer elements. Thus, rather than obtaining two separate photographs of a subject, as taught in Kay, et al., Claim 1, as amended, specifically features rendering in a computer the elements of an image layer scene over a full black background and over a full white background. It is respectfully submitting that Kay, et al. does not describe or suggest rendering an image layer scene by first rendering in a computer the elements of an image layer scene over a black background and over a white background to obtain separate color components for each pixel of the image layer scene rendered over each background, as specifically featured in Claim 1, as amended. As will be discussed in more detail below, rendering image layer scene elements over the appropriate backgrounds in a computer, versus taking photographs of a subject in front of selected backgrounds, affects how such images may be processed to obtain an image for compositing with other images.

Claim 1, as amended, also specifically features rendering the elements of an image layer scene over a full black background and over a full white background to obtain color components for each pixel of the image layer scene rendered over full black and over full white, and combining the resulting color components to form a rendered image layer scene. Kay, et al. describes and suggests taking two separate photographic images of a foreground subject with the subject placed in front of separate background colors. Kay, et al. specifically suggests taking one of the photographs in front of a "black" background and the other of the photographs in front of a "white" background. Due to lighting variations and other factors, it is apparent, however, that the "black" and "white" backgrounds used for the photographic images used in the process described in Kay, et al. are only nominally or approximately "black" and "white". Kay, et al. recognizes this fact and describes the requirement for determining accurately what the background image colors actually are. (See, e.g., column 8, line 37 through column 9, line 14 of Kay, et al.) As discussed above, rather than using photographic images, Claim 1, as amended, features rendering in a computer the elements of an image layer scene over a full black background and over a full white background to obtain color components for each pixel of the image layer scene rendered over the two different backgrounds. Since, in accordance with Claim 1, the elements of the image layer scene are rendered in a computer it is possible to render the elements of the image layer scene over a full or perfect black background and over a full or perfect white background. This result cannot be obtained if photographic images are employed, as taught in Kay, et al. Therefore, it is respectfully submitted that Kay, et al. does not describe or suggest rendering in a computer the elements of an image layer scene over a full black background and over a full white background to obtain color components for each pixel of the image layer scene rendered over full black and full white and then combining the color components for each pixel of the image layer scene rendered over full black and over full white to form an image layer scene, as featured in Claim 1, as amended. Therefore, it is respectfully submitted that Claim 1, as amended, is not anticipated by, or unpatentably obvious over, Kay, et al., and is, therefore, in condition for allowance.

Claim 2 of the present application depends from independent Claim 1, and incorporates the features thereof. (By the foregoing amendment, Claim 2 has been amended to correspond the language thereof to Claim 1, as amended.) Therefore, it is respectfully submitted that Claim 2, as amended, also is not anticipated by, or unpatentably obvious over, Kay, et al., for the reasons just discussed, and is, therefore, also in condition for allowance.

It is further noted that Claim 2, as amended, features a more specific method of combining the color components for each pixel of an image layer scene rendered over full black and over full white to obtain a rendered image layer scene. In particular, Claim 2 features (a) determining an alpha value for each corresponding pixel of the image layer scene rendered over the full black and full white backgrounds as one (1) plus the value of a single color component of the pixel from the image layer scene rendered over full black minus the value of the same color component of the corresponding pixel from the image layer scene rendered over full white, (b) setting all the color component values of the pixel to zero if the alpha value for the pixel equals zero, and (c) otherwise setting the color component values of the pixel to the corresponding color component values of the corresponding pixel from the image layer scene rendered over full black divided by the alpha value for the pixel. This method is illustrated, for example, by the exemplary equations presented in paragraph [0026] of the application specification. It is respectfully submitted that Kay, et al. does not describe or suggest the specific method for combining color components to form a rendered image scene as featured in Claim 2, as amended.

The details of the method for generating a mask for photo-compositing as taught in Kay, et al. are presented in columns 7 and 8 thereof. It is respectfully submitted that the relatively complex equations presented in Kay, et al. are different from the much simpler equations used for combining color components to form a rendered image scene as featured in Claim 2, as amended. It is believed that this may be a result of the fact that Kay, et al. employs photographic images taken over different colored backgrounds as the starting point, rather than image layer elements rendered in a computer over full black and full white backgrounds, as discussed in detail above. A specific comparison between

the method taught in Kay, et al. and the method featured in Claim 2, as amended, reveals that Kay, et al. describes and suggests finding a Cartesian distance between color components in each pixel of two photographic images divided by the maximum distance between the color components of the backgrounds of the two images to determine a transparency value. In contrast, Claim 2 features determining an alpha value as one (1) plus the value of a single color component of the pixel from the image layer scene rendered over full black minus the value of the color component of the corresponding pixel from the image layer scene rendered over full white. Clearly these are different calculations. Whereas Kay, et al. teaches calculating the color component values from the resulting transparency value using the equations presented in column 7, lines 46-67, thereof, Claim 2, as amended, features setting the color component values of a pixel to zero if the alpha value for the pixel equals zero, otherwise setting the color component values of the pixel to the corresponding color component values of the corresponding pixel from the image layer scene rendered over full black divided by the alpha value for the pixel. These also clearly are different calculations. (The differences can be seen by comparing the equations in column 7 of Kay, et al. with those in paragraph [0026] of the specification of the present application.) Since Kay, et al. does not describe or suggest the specific method for combining color components for each pixel of an image layer scene rendered over full black with the color components for each corresponding pixel of the image layer scene rendered over full white to form an image layer scene, as featured in Claim 2, as amended, it is respectfully submitted that Claim 2, as amended, is not anticipated by, or unpatentably obvious over, Kay, et al., for this additional reason and is, therefore, in condition for allowance.

Dependent Claim 3 depends from dependent Claim 2, and incorporates the features thereof. (By the foregoing amendment, Claim 3 has been amended to correspond to the language of amended Claims 1 and 2.) Therefore, it is respectfully submitted that Claim 3, as amended, also is not anticipated by, or unpatentably obvious over, Kay, et al., and is, therefore, also in condition for allowance.

Independent Claim 4 of the present application is drawn to a method for rendering a multi-layer image. Independent Claim 4 features the steps of Claim 1 and the additional steps of rendering a background image layer and compositing the background image layer with the foreground image layer formed using the method steps featured in Claim 1 to form a multi-layer image. By the foregoing amendment, Claim 4 has been amended in a manner similar to Claim 1, to feature rendering in a computer the elements of the foreground image layer scene over a full black background and over a full white background and combining the color components for each pixel of the foreground image layer scene rendered over full black and over full white to form the rendered foreground image layer. As discussed above, it is respectfully submitted that Kay, et al. does not describe or suggest such a method for rendering a foreground image layer as featured in Claim 4, as amended. Therefore, for the reasons discussed above with reference to Claim 1, it is respectfully submitted that Claim 4 is not anticipated by, or unpatentably obvious over, Kay, et al. and is, therefore, in condition for allowance.

Dependent Claim 5 depends from independent Claim 4 and incorporates the features thereof. (By the foregoing amendment, dependent Claim 5 has been amended to correspond the language thereof to independent Claim 4, as amended.) Therefore, it is respectfully submitted that Claim 5, as amended, also is not anticipated by, or unpatentably obvious over, Kay, et al., and is, therefore, in condition for allowance. It is also respectfully noted that dependent Claim 5 includes steps that define the specific method for combining color components for each pixel of an image layer scene rendered over full black with the color components for each corresponding pixel of the image layer scene rendered over full white as featured in Claim 2. Therefore, it is respectfully submitted that Claim 5, as amended, also is not anticipated by, or unpatentably obvious over, Kay, et al., for the reasons discussed above in detail with reference to Fig. 2.

Dependent Claims 6-10 depend from Claims 1, 4, and 5, and incorporate the features thereof. Therefore, it is respectfully submitted that dependent Claims 6-10 also are not anticipated by, or unpatentably obvious over, Kay, et al. for the reasons discussed above with reference to Claims 1, 4, and 5.

It is respectfully noted that new Claims 9 and 10, which depend from Claim 1 and 4, respectively, specify that the color components referred to in the claims from which they depend are RGB color components.

For the foregoing reasons, it is respectfully submitted that none of the Claims 1-10 as currently pending and amended, or added, by the foregoing amendment are anticipated by, or unpatentably obvious over, Kay, et al. and are, therefore, in condition for allowance. Favorable action on the present application is, therefore, respectfully requested.

Respectfully submitted,

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